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Operating instructions

electronic solenoid valve control type IFC 10

Driftinstruktion
Bedrijfshandleiding
Instruções de serviço
Instrucciones de servicio
Istruzioni per l`ésercizio
Instruction de service
Betriebsanleitung

Operating instructions

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Appendix

A Declaration of conformity

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1 Safety precautions and warnings

IMPORTANT NOTICE!

Non-observance of the safety instructions can result in severe personal injury or property damage.

This equipment may be installed, connected, commissioned, operated and maintained by qualified and authorised personnel only, under strict observance of these operating instructions, any relevant standards and legal requirements.

Take particular note of the general and regional installation and safety regulations regarding work on high voltage installations (e.g. VDE), as well as the relevant regulations regarding the correct use of tools and personal protective gear.

Hazardous voltages are present in this electrical equipment during operation.

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1.1 Designation of electrical apparatus for explosion hazardous areas

Designation according to Directive 94/4/EC:	**II 3D**
Sign	**Signification**
II	Equipment group II
3	Equipment category 3
D	For explosive mixtures of air and combustible dust

Particular addition to EN 60079-0	**Ex tc IIIB T80°C Dc X IP65 Ta:-5°C … +40°C**
Ex	Ex-protection at European standard
tc	Protection class: protection by enclosure, use in category 3D
IIIB	Dust-group: non-conductive dust
T80°C	Maximum surface temperature
Dc	EPL= Equipment Protection Level: Dust (II 3D)
X	Remarks for special conditions for safe use
IP 65	Ingress protection IP 65
Ta: -5°C … +40°C	Permissible operating temperature range

Areas of application	
Equipment category	**Explosive dust air mixtures (D)**
Category 1	Zone 20, 21 or 22
Category 2	Zone 21 or 22
Category 3	Zone 22 not conductive dust
Equipment group II Category 3D **Electrical apparatus for use in the presence of combustible dust**	Equipments, that are constructively arranged to operate in agreement with the characteristic quantities given by the manufacturer and ensure a normal measure of safety. Equipments of this category are intended for the use in areas where you have not to calculate with an explosive atmosphere of dust whirled up. If an explosive atmosphere appears nevertheless, in all probability it will be only rare and during a short time period.

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1.2 Operation of the unit in the add-on housing

ATTENTION!

The control may be worked in the normal operation only with closed lid.

For commissioning and maintenance work with power on you must make sure that no explosive atmosphere of dust-air mixture is present or could occur.

Otherwise the lid may be opened only if the power is switched off.

At least the ingress protection IP54 must be guaranteed.

1.3 Remarks for special conditions for safe use in explosion hazardous areas zone 22

ATTENTION!

1. Permissible operating temperature range Ta: -5°C to +40°C.
2. The control has to be installed within the visual range and must be protected from any mechanical damage.
3. The control must be protected for ultraviolet light (daylight or ultraviolet light from lamps) respectively mounted in a protected place.
4. Avoid dust deposits on the unit.
5. To avoid electrostatic charging clean the unit with a damp cloth only. Rubbing with nonconductive materials must be strictly avoided.

2 Use as agreed

NOTE!

If used incorrectly application-related dangers may arise.

The control was developed for the cyclic dedusting of filterelements with compressed air impulses.

Up to 10 solenoid valves can be controlled in rotation, with adjustable impulse and delay timing periods.

A 24VDC-Remote control input is available for an external start.
A potential free relay contact is availabe to give an operatinal message to a host system.

The control must not be operated outside of its electrical, thermal and mechanical performance limits.

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3 Technical data

Supply voltage (see type plate)	**220 to 240VAC 50/60Hz**	**110 to 120VAC 50/60Hz**	**24VDC**
voltage tolerance	+/- 5%		24-32VDC
	switchable with mains switch		
fuse	315mA medium slow	630mA medium slow	1,6A medium slow
quiescent current consumption	typically 40mA	typically 80mA	typically 60mA

Type	**IFC 10 E in add-on housing polycarbonate**	**IFC 10 PE in add-on housing polyester**	**IFC 10 S in metal chassis**
output	1-10 solenoid valve outputs 24VDC, output power max. 24W/1A, activated manually by means of a multi-contact switch. All outputs are suppressed with a recovery diode.		
impulse period	adjustable from 60 to 600 ms, indicated by red LED		
delay period	adjustable from ***6 to 60*** ms, indicated by green LED		
indication by LED	red: overload, wire breakage, collect fault green: operational signal (active)		
signal output	operational signal, LED green, potential-free relay contact, normally open, contact load max.: I = 0,5A, U = 230VAC		
control input	remote control input (R) for activation, 24VDC, yellow LED, current consumption approx. 15mA,		
supply voltage for external triggers	24VDC, 50mA max.		
housing material	polycarbonate, transparent lid	Polyester, glass-fibre, reinforced surface resistance <10^9 Ω (anti-static)	metal, powder-coated
colour	RAL 7035 (light grey)	RAL 9005 (deep black)	white
installation	wall installation		on carrier profiles 35 mm

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Type	IFC 10 E in add-on housing polycarbonate	IFC 10 PE in add-on housing polyester	IFC 10 S in metal chassis
ingress protection	IP65 to EN 60529		IP 20 for cabinet mounting
dimensions (B x H x T)	160 x 240 x 90 mm	160 x 260 x 91 mm	150 x 196 x 61 mm
weight	1,7kg	3,1kg	1,65kg
cable entries	3 x M16, 2 x M20		-
clamp range of cable entries	M16 for 4,0 to 8,0 mm M20 for 6,5 to 12,0 mm		-
connection cross section	0,2 to 2,5 mm²		
ex-approval to ATEX	Ⓔx II 3D Ex tc IIIB T80°C Dc X IP65 Ta: -5°C …+40°C	Ⓔx II 3D Ex tc IIIB T80°C Dc IP65	-
maximum surface temperature *T* of the housing (category 3D) at 40°C ambient temperature	80°C		-
Permissible ambient temperature	Ex-area zone 22: Ta: - 5 °C to + 40°C Not ex-area: - 20 °C to + 40°C	- 20 °C to + 40°C	- 20 °C to + 55°C
Conformity	• Low voltage directive 2006/95/EC (EN 60204-1) • Electromagnetic compatibility directive 2004/108/EC t (EN 61000-6-1, EN 61000-6-2, EN 55014-1) • ATEX directive 94/9/EC (EN 60079-0, EN60079-31)		• Low voltage directive 2006/95/EC (EN 60204-1) • Electromagnetic compatibility directive 2004/108/EC (EN 61000-6-1, EN 61000-6-2, EN 55014-1)
	CE		

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4 Installation

ATTENTION!

Observe relevant regulations!

For use in Ex-Area you have to check whether the unit with the Ex-approval is suitable for the application.

(refer to type plate and technical data)

In general The control is to be installed in a vibration-free location.

Add-on housing The control in the add-on housing is suitable for the installation in the plant. To be used in the explosion-hazardous areas (ex-areas) zone 22 not-conductive dust and in not ex-areas.

After removal of the lid, the mounting holes are accessible.

Add-on housing polycarbonate The polycarbonate add-on housing is suitable for use indoors. For the installation outdoors the housing must be protected for weather influences with a roof or similar.

Refer to drawing 4.1 for mounting dimensions.

Add-on housing polyester The polyester add-on housing could be installed indoors and outdoors under hard conditions. The mechanical resistance is high. Polyester is absolutely corrosion-proof and high-resistance against aggressive chemical medium and weather resistant.

Refer to drawing 4.2 for mounting dimensions

Metal chassis The control in the metal chassis is suitable for cabinet mounting with quick-to-fasten clamps. Fitting to 35mm carrier profiles according to DIN EN 50022.

Refer to drawing 4.3.

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4.1 Safety notes for the installation

IMPORTANT NOTICE!

- Install according to the manufacturer´s instructions and the respective national regulations and provisions as well as the relevant installation regulations.
- Connect and carry the ground wire.

4.2 Safety notes for the installation of the add-on housing

IMPORTANT NOTICE!

The unit must be installed such that the degree of protection IP 65 to EN 60529 is guaranteed (state of delivery).

Therefore it is important

- to fix all screws of the lid,
- to mount the cable entries competently,
- to close unnecessary cable entries with stoppers,
- to use in the ex-area only cable glands and stoppers approved for this area.
- The requirements of the EN 60079-14 must be met.

In addition, only the connection of permanently installed cable and wire is allowed. A corresponding strain relief must be ensured.

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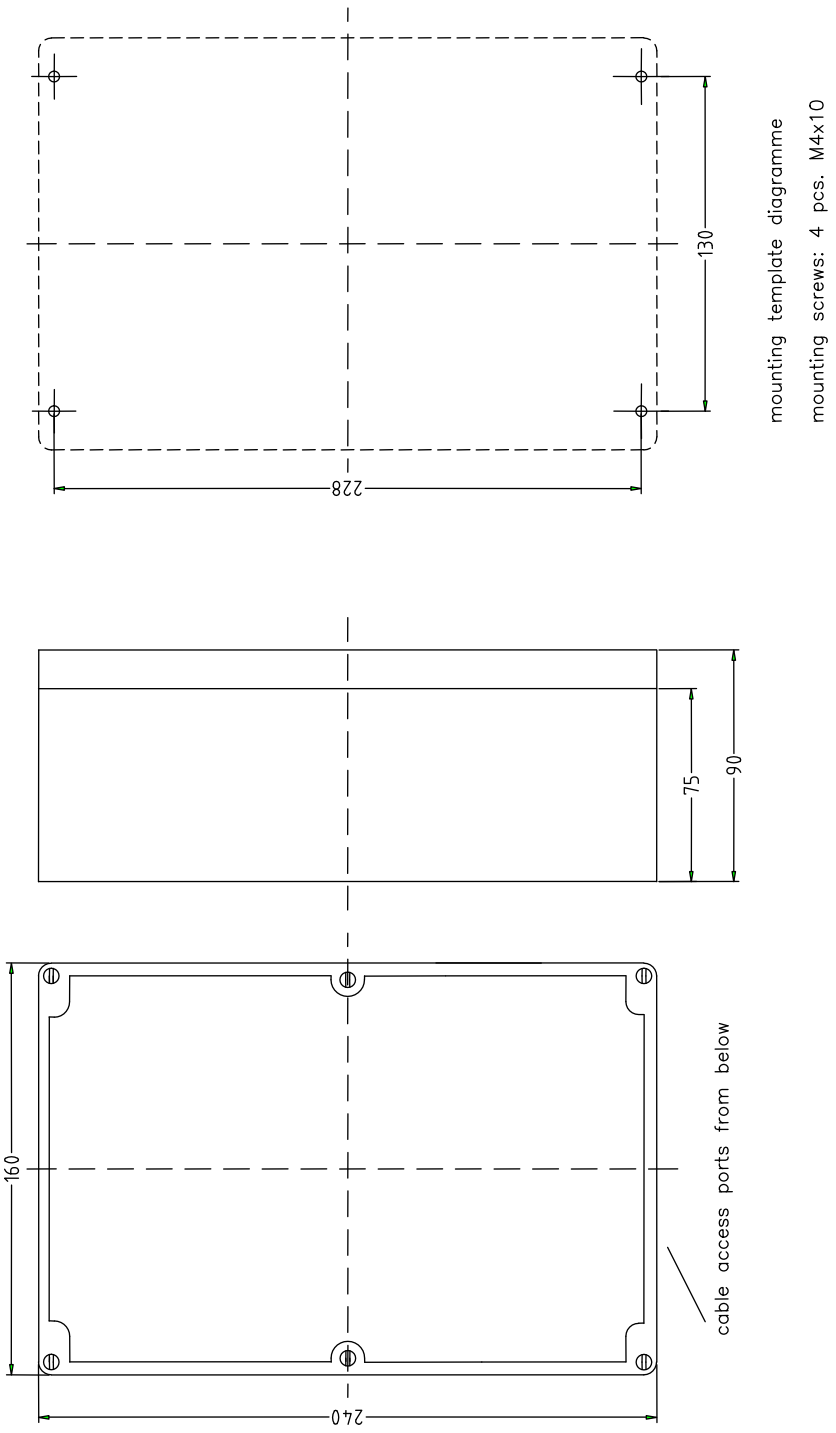

Drawing 4.1: Add on housing

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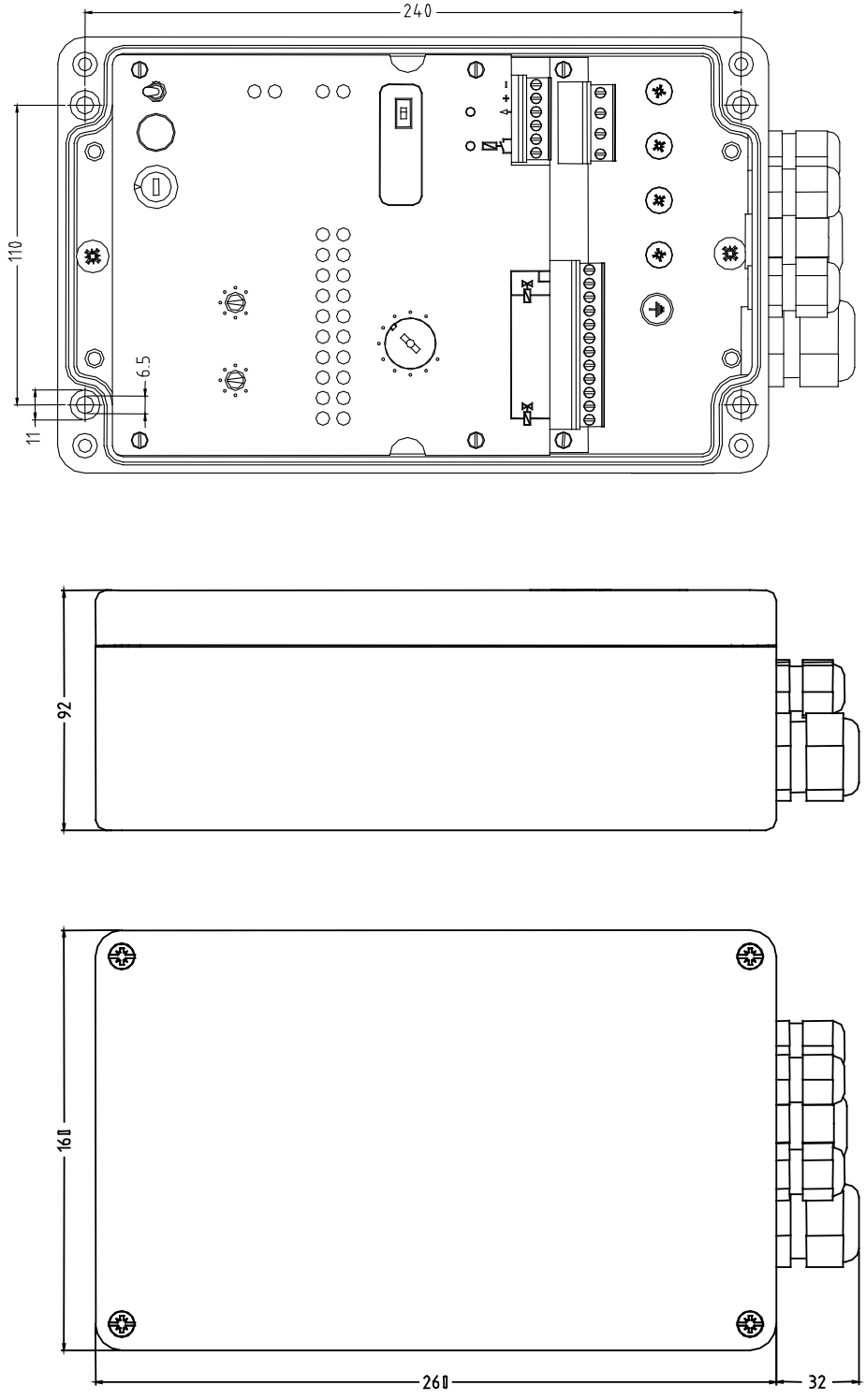

Drawing 4.2: Add-on housing Polyester

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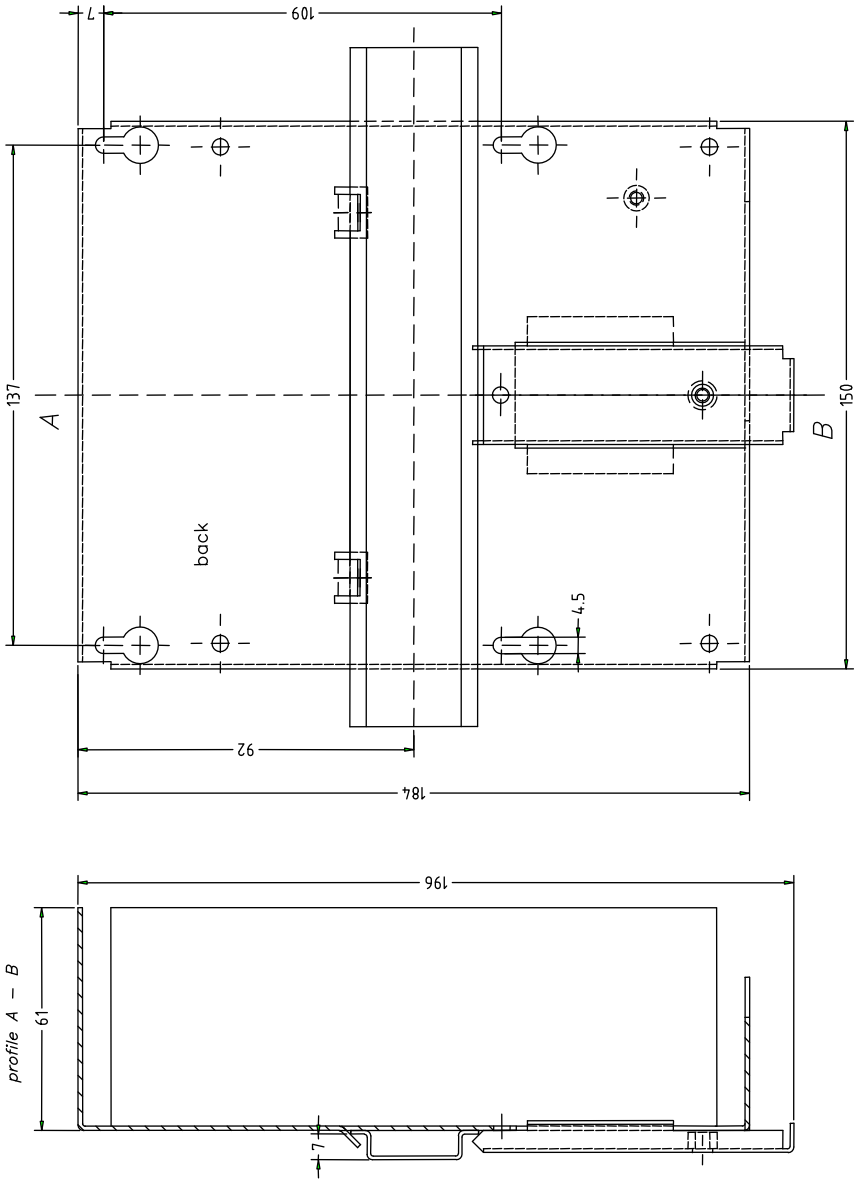

Drawing 4.3:
Metal chassis as a rack-mountable version

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5 Electrical connection

IMPORTANT NOTICE!

The unit may only be connected to the supply voltage as indicated on the type plate.

The connection of 115 VAC or 230 VAC to a control for 24 VDC will lead to destruction of the entire control unit.

In general

The control is to be connected according to drawing 5.1.

The values given in the technical specification are to be observed (refer to section 3).

Supply voltage

The supply voltage is to be connected to contact strip (1) (refer to drawing 6.1).

Solenoid valves

The solenoid valves are to be connected to contacts 1 to 10 on contact strip (2). The plus poles of the solenoid valves must be bound together and connected to contacts 11 and 12.

Connect the ground wire to PE on contact strip (1). At the polyester add on housing it is also possilble on connect the ground wire on the mounting plate.

The power of the conntected solenoid vales may not be exceeded the maximum output power.

Operating signal output

The operating signal output is available at contacts 21 and 22 on contact strip (3). It´s a potential-free normally open relay contact (refer to Section 7.2).

Signal input (F)

Contact 24 on contact strip (3) is for connection of the remote control signal.

Supply of power to the triggers is available from contact 25, plus 24VDC and contact 26 0V potential.

Refer also to Section 7.1.

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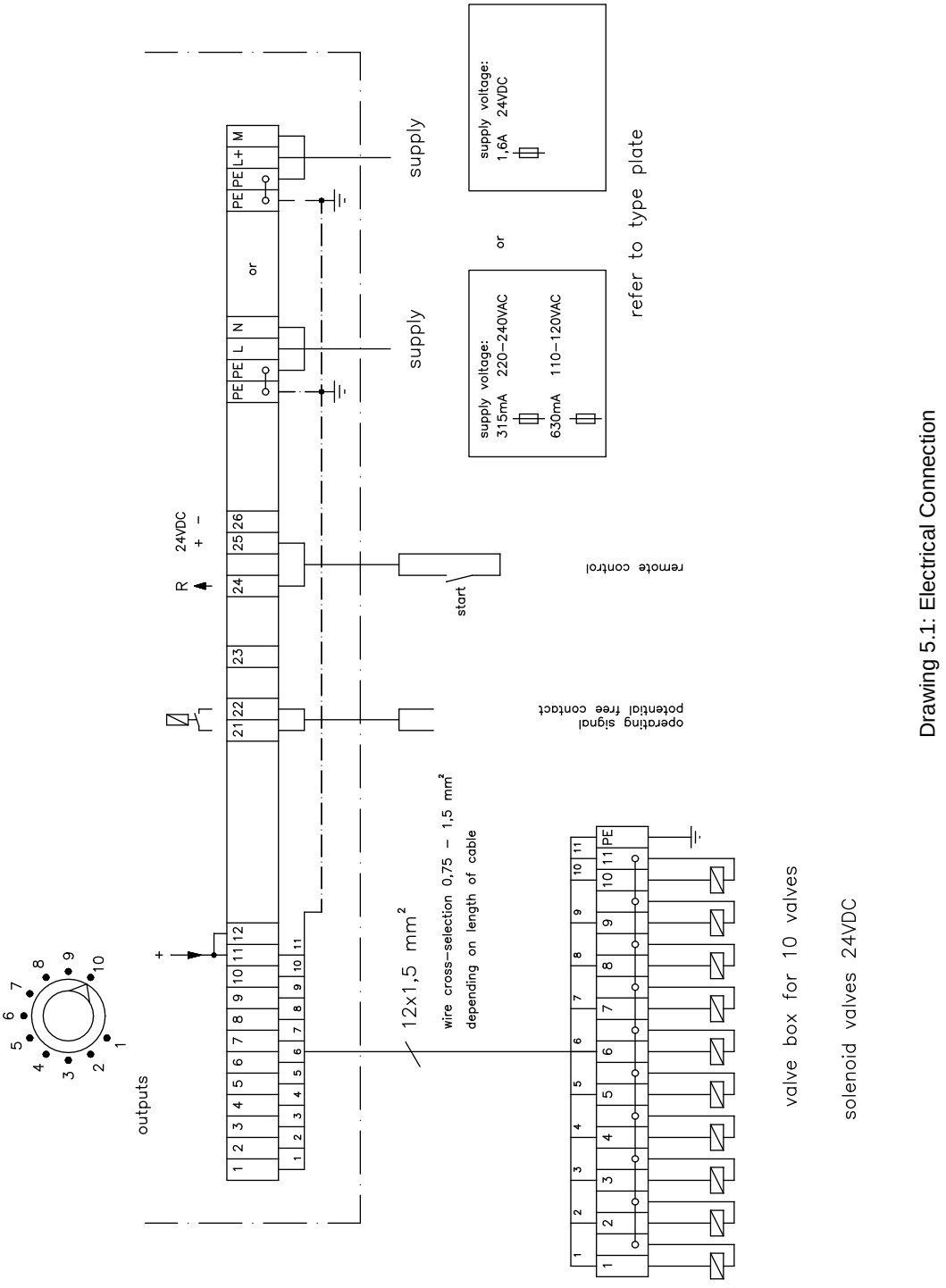

Drawing 5.1: Electrical Connection

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6 Commissioning

ATTENTION!

For commissioning and maintenance work you must make sure that no explosive atmosphere of dust-air mixture is present or could occur.

Otherwise the lid may be opened only if the power is switched off.

The control must not be operated outside of its electrical, thermal and mechanical performance limits.

The following points are to be carried out in the sequence given for initial operation. Refer to drawing 6.1:

- Set the ON/OFF-switch (6) to OFF.
- Check with the type plate which supply voltage is suitable for the unit on hand. 110-120VAC and 220-240VAC **or** 24VDC
- Set the mains voltage switch (4) to the correct setting for the available supply voltage (110-120V or 220-240V)
- Ensure that the correct fuse is inserted. Refer to the technical data.
- Pre-select the outputs to be controlled by setting multi-position switch (7), as desired
- Set the potentiometers delay and impulse time (10)(11) according to the specifications of the filter manufacturers.
- Select the operating mode by means of the DIP switch (16):

  DIP switch ON ⇨ start the controller either via remote control or pressure difference switch (refer to section 7.1)

  DIP switch OFF ⇨ controller direct start at connecting supply voltage
- Re-check that the controller is correctly connected in accordance with the connection diagram, drawing 5.1.
- Connect the supply voltage according to the type plate and activate the controller by using the ON/OFF switch (6).

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Signalling	The following LED's will come on after the controller has been switched on:		
	active (green)	(14)	if remote control function is active, start via 1 signal on input "R"(refer to Section 7.1)
	next output (green)	(8)	
	operational message (green)	(17)	only if controller is ACTIVE
	signal R (yellow) remote control	(18)	depends on switch status of connected trigger
Start with remote control	The dedusting process commences as soon as 1 signal is detected at input R. The connected solenoid vales will be controlled with the selected impuls-delay periode. 0 signal at input R stops the valve control. The control continues with a renewed star.		
Remote control OFF	The dedusting commences as soon as the supply voltage is connected. The connected solenoid vales will be controlled with the selected impuls-delay periode.		
	• Check that the solenoid valves are working correctly At a fault-free drive the operational message contact remains closed for the complete run. LED (17) lights without interruption.		
	• After completing the commissioning: Screw the lid on again and check the cable entries. Not needed cable entries must be closed with stoppers. (Only relevant for the control in add on housing)		

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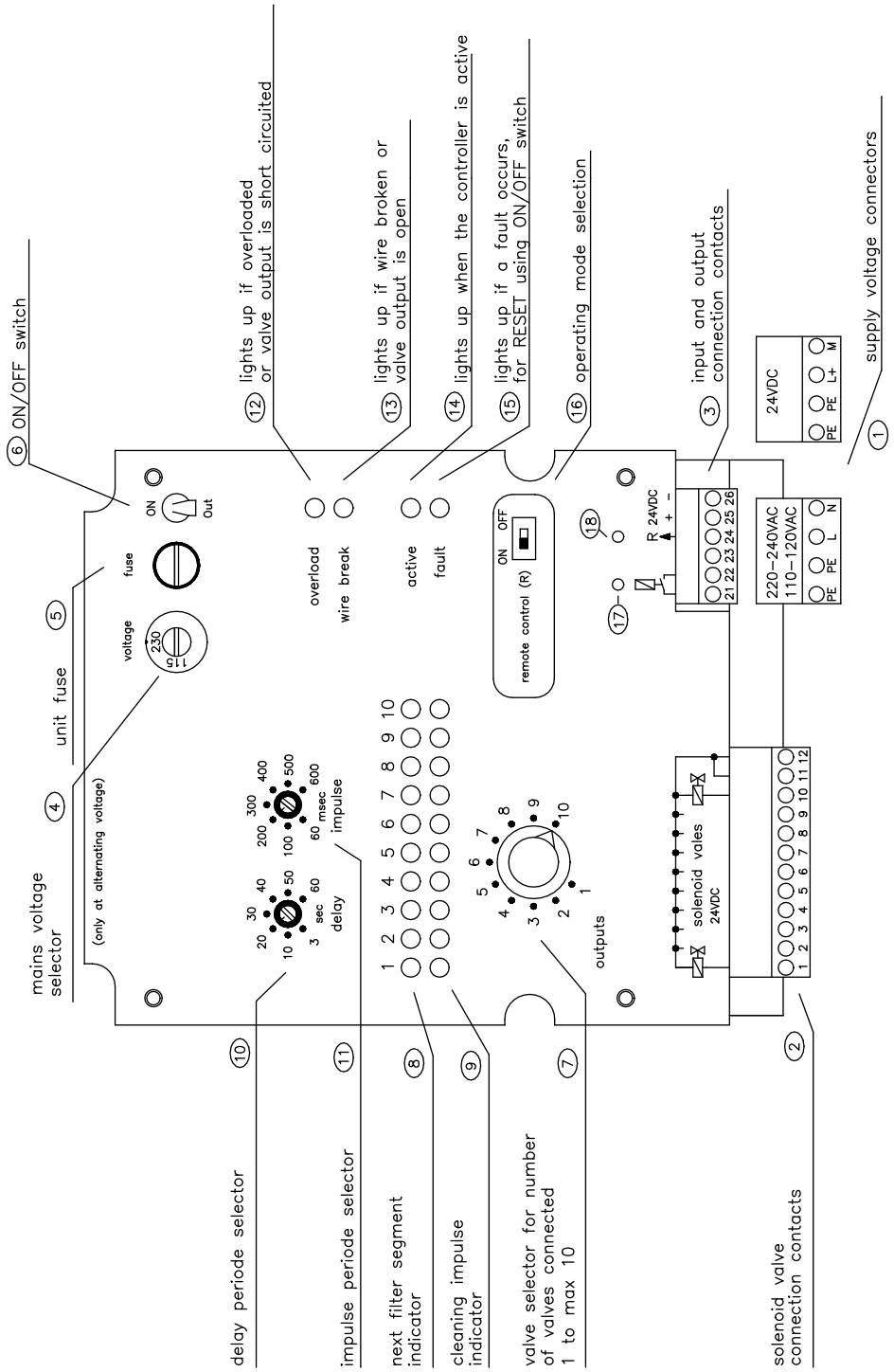

Drawing 6.1:
Front panel overview

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7 Control and signal funtions

7.1 Remote control input R

It is possible to control the controller remotely via input R on contact strip (3). The following switch types may be connected to input R.

1. potential-free contact (switch or relay)
2. switch with electronic output PNP
3. 12 to 30 VDC, against 0 V
4. the input is reverse polarity safe

The remote control function is activated by setting DIP switch 3 (16) to ON and de-activated when that switch is set to OFF. The DIP switch position may be changed whilst the controller is in operation.

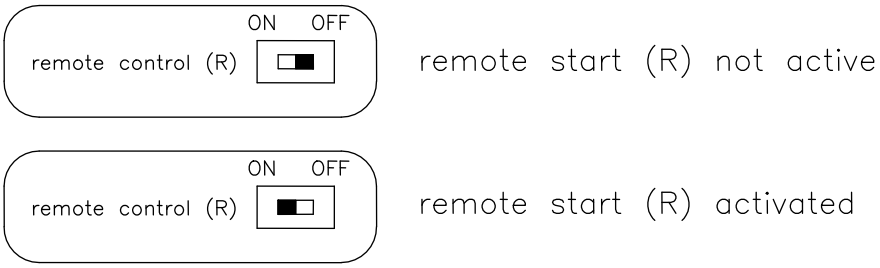

Illustration 7.1: Possible settings of DIP switch

If the remote control function is activated, the dedusting process commences as soon as 1 signal is detected at input ***R*** LED (18) lights up.

If the remote control function is not active, then dedusting commences as soon as the supply voltage is connected.

Input R may alternatively be used for connection of a pressure difference switch. This starts the dedusting process in dependence to the filter resistance.

If the pressure difference switch is to be connected to input R as well as the remote control, then the remote control start signal must be wired in series with the pressure difference switch contact.

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7.2 Operational message

A potential-free normally open relay contact is available on contact strip (3) for indicating the operational status.

The operating relay only closes if the controller is switched to ACTIVE. If a fault occurs, such as overload or wire break, the operating relay will open.

The controller will continue operation without interruption.

The relay will close again as soon as no further faults are detected. The green LED (17), above contact strip (3) will light up.

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8 Fault messages

The fault indication “wire break“ is assigned to the disturbed output. This indicator will go off when the next non-faulty impulse is received.

Example: The message “wire break” occurs after the output 5 was controlled. After controlling the output 6 the LED wire break goes off again.
From this results that the wire break fault was causes from the solenoid valve 5.

8.1 Causes of fault and elimination

Messages	Indication	Causes of fault	Elimination
Wire break	LED red This indicator will go off when the next non-faulty impulse is received.	No output load during the control impulse or short-circuited valve output.	• Check the settings of the multi-position switch (7). The number of connected valves must agree with the adjusting of the multi-position switch • Check the valve connection • Check the valve

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EC Declaration of Conformity

electronic solenoid valve control type IFC 10

Herewith we declare that the electronic solenoid valve controls

IFC 10 E in add-on housing polycarbonate IP65
IFC 10 PE in add-on housing polyester IP65
IFC 10 S with metal chassis IP20

comply with following relevant regulations:

- EC directive **2004/108/EG** on electromagnetic compatibility
- EC low voltage directive **2006/95/EG**

Applied standards:

- EN 61000-6-1
- EN 61000-6-2
- EN 55014-1
- EN 60204-1

Further we declare that in addition to the regulations specified above the electronic solenoid valve controls

IFC 10 E in add-on housing polycarbonate IP65
IFC 10 PE in add-on housing polyester IP65

comply also with the

- EC directive **94/9/EG** *Equipment and protective systems intended for use in potentially explosive atmospheres*

Applied standards in addition to those listed above:

- EN 60079-0
- EN 60079-31

Hude, *26.02.2015*

(R. Hainke – Geschäftsführer)